

28. A printing apparatus according to claim 27,
wherein the recording is executed by discharging ink by
the heat of said heat generating element.

5 29. A printing apparatus according to claim 24,
wherein said recording execution means includes a heat
generating element for recording.

30. A printing apparatus according to claim 29,
10 wherein the recording is executed by discharging ink by
the hat of said heat generating element.

31. A head substrate of a printing head
detachably mounted on a printer main body, comprising:
15 plural external connection terminals for
externally entering various signals and a driving
electric power;

recording execution means for executing a
recording operation according to the various signals
20 and the driving electric power externally entered into
said external connection terminals;

data memory means for executing data writing and
data readout;

memory access means for executing the data writing
25 into said data memory means in response to the various
signals and the driving electric power externally
entered into said external connection terminals and the

Sub
E

Sub
E1

data readout corresponding to the various signals; and
writing inhibition means for permanently disabling
the data writing into said data memory means by said
memory access means.

5

32. A head substrate according to claim 31,
wherein:

Sub
E1

10 said writing inhibition means is adapted for
cutting off an electric power wiring for supplying the
driving electric power for data writing from said
external connection terminals to said memory access
means.

15 33. A head substrate according to claim 31,
further comprising:

common terminal wiring means for connecting said
memory access means and said recording execution means
to a common external connection terminal.

20 34. A head substrate according to claim 31,
wherein:

said external connection terminals receive, at one
thereof, from the exterior, an access permission signal
for permitting the data writing;

25 said memory access means executes data writing
into said data memory means when the access permission
signal is externally entered from said external

connection terminal; and

Sub
E1
said writing inhibition means is adapted for
cutting off an electric power wiring for supplying the
driving electric power for data writing from said
5 external connection terminal to said memory access
means.

35. A head substrate according to any of claims
31 to 34, wherein:

Sub
E1
10 said memory access means writes data of plural
kinds in succession in said data memory means; and
said writing inhibition means individually
disables data overwriting for the data of the plural
kinds written in succession in said data memory means
15 by said memory access means.

36. A head substrate according to any of claims
31 to 34, wherein:

20 said plural external connection terminals
externally receive, as the various signals, a binary
logic signal corresponding to whether or not to execute
the recording, a recording image signal and a clock
signal;

25 said recording execution means is adapted for
executing a recording operation by externally receiving
the recording image signal and the clock signal when
said binary logic signal externally entered from said

external connection terminals is in a first state; and
said memory access means is adapted for executing
at least either of data writing into or data readout
from said data memory means at a timing corresponding
5 to the clock signal, when said binary logic signal
externally entered into said external connection
terminal is in a second state.

Sub
B3
37. A head substrate according to any of claims
10 31 to 34, wherein:

said recording execution means is adapted for
executing a recording operation based on the recording
image signal serially entered into a specified one of
said external connection terminals; and

15 said memory access means is adapted for writing
data, serially entered from said specified one of said
external connection terminals, into said data memory
means, and serially outputting the data read from said
data memory means to said specified one of said
20 external connection terminals.

38. A head substrate according to any of claims
31 to 34, wherein:

25 said recording execution means is adapted for
executing a recording operation based on the recording
image signal parallel entered into specified ones of
said external connection terminals; and

Sub
B2E1

said memory access means is adapted for writing data, parallel entered from said specified plurality of said external connection terminals that parallel receive the recording image signal, into said data memory means, and for serially outputting the data, read from said data memory means, to said specified plurality of said external connection terminals that parallel receive the recording image signal.

Sub
E1

10 39. A head substrate according to claim 36, wherein the clock signal for executing the recording operation and the clock signal supplied to said memory access means are used in common.

15 40. A printing head detachably mounted in a printer main body, comprising a head substrate according to any of claims 31 to 34.

20 41. A printing head according to claim 40, wherein said recording execution means includes a recording element for recording.

25 42. A printing head according to claim 41, wherein said recording element is a heat generating element.

43. A printing head according to claim 42,

Sub
E1
wherein the recording is executed by discharging ink by
the heat of said heat generating element.

5 44. A printing head detachably mounted in a
printer main body, comprising a head substrate
according to claim 36.

10 45. A printing head detachably mounted in a
printer main body, comprising a head substrate
according to claim 37.

Sub
E1
15 46. A printing head detachably mounted in a
printer main body, comprising a head substrate
according to claim 38.

47. A printing head detachably mounted on a
printer main body, comprising:

20 plural external connection terminals for
externally entering various signals and a driving
electric power;

recording execution means for executing a
recording operation according to the various signals
and the driving electric power externally entered into
said external connection terminals;

25 data memory means capable of data readout; and
memory access means for reading data stored in
said data memory means;

Sub
E1

wherein said memory access means is rendered, by writing inhibition means, permanently incapable of data writing into said data memory means.

5 48. A printing head according to claim 47,
wherein said recording execution means includes a recording element for recording.

Sub
E1

10 49. A printing head according to claim 48,
wherein said recording element is a heat generating element.

15 50. A printing head according to claim 49,
wherein the recording is executed by discharging ink by the heat of said heat generating element.

Sub
E1

20 51. A method for producing a printing head detachably mounted on a printer main body, comprising:
a step of preparing a head substrate including plural external connection terminals for externally entering various signals and a driving electric power; recording execution means for executing a recording operation according to the various signals and the driving electric power externally entered into said
25 external connection terminals; data memory means capable of executing data writing and data readout; memory access means for executing the data writing into

Sub
BSE1

said data memory means in response to the various signals and the driving electric power externally entered into said external connection terminals and executing the data readout corresponding to the various signals; and writing inhibition means for permanently disabling the data writing into said data memory means by said memory access means;

a step of executing data writing into said data memory means by said memory access means; and

10 a writing inhibition step of permanently disabling, by said writing inhibition means after the data writing, the data writing into said data memory means by said memory access means.

15 52. A method for producing the head substrate according to claim 51, wherein:

said writing inhibition means is adapted for cutting off an electric power wiring for supplying the driving electric power for data writing from said external connection terminals to said memory access means.

53. A method for producing the head substrate according to claim 51, wherein:

25 said writing inhibition means is adapted for cutting off a signal wiring for connecting said external connection terminals, externally receiving an

access permission signal for permitting the data writing, and said memory access means.

54. A method for producing the head substrate according to any of claims 51 to 53, wherein:

said data writing step writes data of plural kinds in succession in said data memory means by said memory access means; and

said writing inhibition step individually disables data overwriting for the data of the plural kinds written in succession in said data memory means by said memory access means.

55. A method for producing a printing head detachably mounted on a printer main body, comprising:
a step of preparing a printing head including plural external connection terminals for externally entering various signals and a driving electric power; recording execution means for executing a recording operation according to the various signals and the driving electric power externally entered into said external connection terminals; data memory means capable of executing data writing and data readout; memory access means for executing the data writing into said data memory means in response to the various signals and the driving electric power externally entered into said external connection terminals and

executing the data readout corresponding to the various signals; and writing inhibition means for permanently disabling the data writing into said data memory means by said memory access means;

5 a step of executing data writing into said data memory means by said memory access means; and

a writing inhibition step of permanently disabling, by said writing inhibition means after the data writing, the data writing into said data memory

10 means by said memory access means.

56. A method for producing the printing head according to claim 55, wherein:

15 said writing inhibition means is adapted for cutting off an electric power wiring for supplying the driving electric power for data writing from said external connection terminals to said memory access means.

20 57. A method for producing the head substrate according to claim 55, wherein:

25 said writing inhibition means is adapted for cutting off a signal wiring for connecting said external connection terminals, externally receiving an access permission signal for permitting the data writing, and said memory access means.

58. A method for producing the printing head according to any of claims 55 to 57, wherein:

5 said data writing step writes data of plural kinds in succession in said data memory means by said memory access means; and

said writing inhibition step individually disables data overwriting for the data of the plural kinds written in succession in said data memory means by said memory access means.

10

59. A printing apparatus comprising:

a printing head according to claim 44;

15 input means for individually transmitting various signals respectively to a plurality of said external connection terminals of said printing head, thereby causing said recording execution means to execute a recording operation; and

20 memory readout means for transmitting various signals to said plural external connection terminal of said printing head, thereby causing said memory access means to execute the data readout.

60. A printing apparatus comprising:

a printing head according to claim 45;

25 input means for individually transmitting various signals respectively to a plurality of said external connection terminals of said printing head, thereby

causing said recording execution means to execute a recording operation; and

memory readout means for transmitting various signals to said plural external connection terminals of said printing head, thereby causing said memory access means to execute the data readout.

61. A printing apparatus comprising:

a printing head according to claim 46;

input means for individually transmitting various signals respectively to a plurality of said external connection terminals of said printing head, thereby causing said recording execution means to execute a recording operation; and

memory readout means for transmitting various signals to said plural external connection terminals of said printing head, thereby causing said memory access means to execute the data readout.

62. A printing apparatus comprising:

a printing head according to claim 44;

wherein said recording input means is adapted for individually transmitting a binary logic signal of a second state and various signals such as a recording image signal and a recording clock signal respectively to a plurality of said external connection terminals of said printing head; and

Sub
E1

Sub
E1

5

said memory readout means is adapted for transmitting the binary logic signal of the second state and the memory clock signal, etc. to the plurality of said external connection terminals of said printing head.

10

63. A printing apparatus comprising:

a printing head according to claim 45;

wherein said recording input means is adapted for serially transmitting the recording image signal to a specified one of said external connection terminals of said printing head; and

15

said memory readout means is adapted for serially receiving the data read by said memory access means, from the specified one of said external connection terminals that serially receives the recording image signal.

20

64. A printing apparatus comprising:

a printing head according to claim 46;

wherein said recording input means is adapted for parallel transmission of the recording image signal to a specified plurality of said external connection terminals; and

25

said memory readout means is adapted for parallel reception of the data read by said memory access means, from the specified plurality of said external

~~B~~
connection terminals that receives in parallel the
recording image signal.

5 65. A printing apparatus comprising:
a printing head according to claim 47; and
means for driving said printing head.

Sub
E1
10 66. A printing apparatus according to claim 65,
wherein said recording execution means includes a
recording element for recording.

15 67. A printing apparatus according to claim 66,
wherein recording element is a head generating element
and ink is discharged by the heat generated by said
heat generating element.
